**IN THE CLAIMS**

Please amend claim 1 as shown below, in which deletions are indicated by strikethrough and/or double brackets, and additions are indicated by underscoring. Please add new claims 13-17. This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently amended) A vehicle speed measuring apparatus for a vehicle comprising:

vibration detection sensors for detecting vibrations from a road surface through tires, the vibration detection sensors being provided at front and rear wheel sides, respectively;

an input section through which the vibration detection sensors input their detection values; and

a processing unit for calculating vehicle speed of the vehicle based on a change pattern of the detection values inputted, wherein the processing unit ~~in order~~ operates in order:

to feature extract a change pattern of the detection values for the respective front and rear wheel sides by excluding inherent tire influences on the detection values when the detection values are inputted through the input section;

to execute pattern matching between the front and rear wheel sides on the basis of the feature extracted change patterns of the detection values;

to obtain a time difference from a coincidence of the change patterns; and

to calculate vehicle speed based on the time difference and a reference distance that is previously stored in the vehicle speed measuring apparatus.



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2. (Original) A vehicle speed measuring apparatus for a vehicle according to claim 1, wherein the vibration detection sensors are wheel speed sensors.

3. (Original) A vehicle speed measuring apparatus for a vehicle according to claim 1, wherein the reference distance is a wheel base of the vehicle.

4. (Original) A vehicle speed measuring apparatus for a vehicle according to claim 2, wherein the reference distance is a wheel base of the vehicle.

5. (Previously presented) A vehicle speed measuring apparatus for a vehicle according to claim 1, wherein the processing unit further operates to calculate an average vehicle speed over a period of time based on multiple calculated vehicle speeds.

6. (Previously presented) A vehicle speed measuring apparatus for a vehicle according to claim 1, wherein the feature extraction operation of said processing unit varies based on vehicle speed.

7. (Previously presented) A method of measuring vehicle speed for a vehicle comprising the steps of:

detecting vibrations from a road surface through tires using vibration detection sensors provided at front and rear wheel sides of a vehicle, respectively;



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feature extracting a change pattern of detection values for the respective front and rear wheel sides as input from said vibration detection sensors by excluding inherent tire influences on the detection values when the detection values are inputted;

executing pattern matching between the front and rear wheel sides based on the feature extracted change patterns of the detection values;

obtaining a time difference from a coincidence of the change patterns; and

calculating vehicle speed based on the time difference and a previously stored reference distance.

8. (Previously presented) A method of measuring vehicle speed according to claim 7, wherein the vibration detection sensors are wheel speed sensors.

9. (Previously presented) A method of measuring vehicle speed according to claim 7, wherein the reference distance is a wheel base of the vehicle.

10. (Previously presented) A method of measuring vehicle speed according to claim 8, wherein the reference distance is a wheel base of the vehicle.

11. (Previously presented) A method of measuring vehicle speed according to claim 7, further comprising the step of calculating an average vehicle speed over a period of time based on multiple calculated vehicle speeds.



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12. (Previously presented) A method of measuring vehicle speed according to claim 7, wherein said feature extraction step is varied based on vehicle speed.

13. (New) A vehicle speed measuring apparatus for a vehicle comprising:

vibration detection sensors for detecting vibrations from a road surface through tires, the vibration detection sensors being provided at front and rear wheel sides, respectively;

an input section through which the vibration detection sensors input their detection values; and

a processing unit for calculating vehicle speed of the vehicle based on a change pattern of the detection values inputted, wherein the processing unit comprises:

a digital filter which receives detection values from the vibration detection sensors and provides filtered detection values which exclude inherent tire influences on the detection values,

a data normalization unit which receives filtered detection values and normalizes the filtered detection values,

a pattern matching unit which executes pattern matching between the front and rear wheel sides based on feature extracted change patterns of the normalized, filtered detection values,

a time difference calculator which calculates a time difference from a coincidence of the change patterns, and

a vehicle speed calculator which calculates vehicle speed based on the time difference and a reference distance that is previously stored in the vehicle speed measuring apparatus.



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14. (New) A vehicle speed measuring apparatus for a vehicle according to claim 13, wherein the processing unit further calculates an average vehicle speed over a period of time based on multiple calculated vehicle speeds.

15. (New) A vehicle speed measuring apparatus for a vehicle according to claim 13, wherein the operation of the digital filter of said processing unit varies based on vehicle speed.

16. (New) A vehicle speed measuring apparatus for a vehicle according to claim 13, wherein the data normalization unit normalizes the detection values by removing a vehicle speed component from the detection values.

17. (New) A vehicle speed measuring apparatus for a vehicle according to claim 14, wherein the multiple calculated vehicle speeds are stored in a first-in-first-out memory so that values of the calculated vehicle speed stored for greater than a specified period of time are replaced with a new calculated vehicle speed value.



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